

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (currently amended) An induction heating system, comprising:
a power source operable to produce an alternating current to inductively heat a workpiece;
a controller operable to control operation of the power source, wherein the controller is operable to receive programming instructions to ~~change~~ selectively increase and decrease workpiece temperature at a desired rate of change and to automatically control operation of the power source to provide inductive heat to the workpiece to ~~change~~ selectively increase and decrease the workpiece temperature at the desired rate of change; and
a temperature feedback device operable to provide the controller with an electrical signal representative of the workpiece temperature.
2. (original) The system as recited in claim 1, comprising a data recorder operable to record workpiece temperature data.
3. (original) The system as recited in claim 1, wherein the power source is operable to provide sufficient power to enable the system to perform stress relief of a workpiece.
4. (original) The system as recited in claim 3, wherein the controller is programmable to direct the system to inductively heat a workpiece to perform the stress relief of the workpiece automatically.

5. (original) The system as recited in claim 1, wherein the controller is operable to control operation of the power source to lower the workpiece temperature at a desired rate of temperature decrease automatically.

6. (original) The system as recited in claim 1, wherein the controller enables a user to establish the desired rate of temperature change by providing a specific desired rate of temperature change.

7. (original) The system as recited in claim 1, wherein the controller enables a user to establish the desired rate of temperature change by providing a desired time period for the workpiece temperature to change and a specific temperature change.

8. (original) The system as recited in claim 1, wherein the controller is operable to control the power source to maintain workpiece temperature at a desired temperature for a desired period of time.

9. (original) The system as recited in claim 8, wherein the controller is operable to change workpiece temperature to a desired workpiece temperature.

10. (original) The system as recited in claim 1, wherein the controller utilizes Proportional-Integral-Derivative (PID) control.

11. (currently amended) An induction heating system, comprising:
an induction heating power source;
a temperature feedback device operable to provide the system with workpiece temperature data; and
a controller operable to control operation of the induction heating power source to increase workpiece temperature to an elevated temperature and to reduce workpiece temperature

from the elevated temperature to a lower temperature at a desired rate of temperature decrease
automatically in response to programming instructions and the workpiece temperature data; ~~and~~
~~a data recorder operable to receive and record the workpiece temperature data.~~

12. (currently amended) The system as recited in claim 11, comprising a data recorder,
wherein the data recorder records the workpiece temperature data digitally.

13. (original) The system as recited in claim 11, comprising a plurality of temperature
feedback devices, wherein the data recorder is operable to record workpiece temperature data from
each of the plurality of temperature feedback devices.

14. (original) The system as recited in claim 13, wherein the plurality of temperature
feedback devices are thermocouples.

15. (currently amended) The system as recited in claim ~~12~~¹¹, comprising a disc drive,
wherein the data recorder is operable to transfer data to the disc drive for storage on a digital
recording media.

16. (currently amended) A system controller for an induction heating system,
comprising:

a control unit operable to control operation of an inductive heating power source operable
to heat a workpiece in response to programming instructions stored in the control unit; and
a user interface to enable a user to provide the programming instructions to the control
unit, wherein the user interface enables a user to program the control unit to form a desired
workpiece temperature profile by assembling a plurality of segments representative of a heating
operation together; and
~~a data recorder operable to record workpiece temperature data.~~

17. (original) The system controller as recited in claim 16, comprising a disc drive operable to copy workpiece temperature data from the recorder to a tangible medium.
18. (original) The system controller as recited in claim 16, comprising a visual display operable to display a graph of workpiece temperature data over time.
19. (currently amended) The system controller as recited in claim 16, comprising a data recorder, wherein the data recorder is operable to print workpiece temperature data stored in the data recorder.
20. (original) The system as recited in claim 16, wherein the system controller is portable.
21. (original) A system controller for an induction heating system, comprising:
a control unit operable to control operation of an inductive heating power source automatically in response to programming instructions; and
a user interface to enable a user to provide the programming instructions to the control unit, wherein the user interface enables a user to establish a sequence of inductive heating operations to be performed automatically by the induction heating system from a selection of inductive heating operations.
22. (original) The system controller as recited in claim 21, wherein one of the inductive heating operations in the selection of inductive heating operations directs the system to change workpiece temperature at a desired rate of temperature change.
23. (original) The system controller as recited in claim 21, wherein the desired rate of temperature change is a decrease in workpiece temperature.

24. (original) The system controller as recited in claim 21, wherein one of the inductive heating operations in the selection of inductive heating operations directs the system to change workpiece temperature by a desired amount over a desired period of time.

25. (original) The system controller as recited in claim 21, wherein one of the inductive heating operations in the selection of inductive heating operations directs the system to maintain workpiece temperature at a desired temperature for a desired period of time.

26. (original) The system controller as recited in claim 21, wherein one of the inductive heating operations in the selection of inductive heating operations directs the system to change workpiece temperature from a current workpiece temperature to a new workpiece temperature.

27. (original) The system controller as recited in claim 21, wherein the system controller is operable to store the sequence of inductive heating operations to be performed automatically by the induction heating system for use in a subsequent inductive heating operation.

28-36. (cancelled)

37. (currently amended) A system for heating a workpiece, comprising:
a power source electrically coupleable to an induction heating device; and
a system controller, comprising:
a control unit operable to control operation of an inductive heating power source automatically in response to programming instructions; and
a user interface to enable a user to provide the programming instructions to the control unit, wherein the user interface enables a user to establish a sequence of inductive heating operations from a selection of inductive heating operations that may be performed automatically by the induction heating system.

38. (original) The system as recited in claim 36, wherein the power source and system controller are portable.

39. (currently amended) A system for heating a workpiece, comprising:
a heating device;
a power source operable to transmit power to the heating device;
a controller operable to control operation of the power source automatically to heat the workpiece according to a desired workpiece temperature profile, wherein the controller is operable to heat the workpiece at a first rate of temperature increase during a first portion of the workpiece temperature profile and to heat the workpiece at a second rate of temperature increase during a second portion of the workpiece temperature profile, the second rate of temperature increase being different than the first rate of temperature increase; and
~~a portable data recorder operable to record workpiece temperature data from a temperature feedback device.~~

40. (original) The system as recited in claim 38, wherein the controller and a data recorder are housed in a common enclosure.

41. (currently amended) A system controller for a workpiece heating system, comprising:
a portable control unit operable to control operation of the workpiece heating system automatically in response to programming instructions, the portable control unit comprising a user interface operable to enable a user to provide programming instructions to the control unit, wherein the user interface enables a user to establish a sequence of heating operations to be performed automatically by the ~~induction~~ workpiece heating system by selecting specific heating operations from a plurality of heating operations.

42. (currently amended) The system controller as recited in claim 401, comprising a data recorder operable to record workpiece temperature data received from at least one temperature feedback device.

43. (original) The system as recited in claim 1, wherein the controller utilizes Proportional-Integral (PI) control.

44. (original) The system as recited in claim 11, comprising a PCMIA module operable to transfer data from the recorder.

45. (original) The system as recited in claim 11, comprising a networking module operable to couple the recorder to a network.

46. (new) A heating system, comprising:
a controller operable to control operation of a power source electrically coupled to a heating device, wherein the controller provides a user with a menu of heating operations that may be programmed into the controller in any combination to establish a desired workpiece temperature profile.

47. (new) The heating system as recited in claim 46, wherein a heating operation in the menu of heating operations is heating a workpiece to a desired temperature.

48. (new) The heating system as recited in claim 47, wherein a heating operation in the menu of heating operations is heating a workpiece at a desired rate of temperature increase.

49. (new) The heating system as recited in claim 48, wherein a heating operation in the menu of heating operations is heating the workpiece at a desired temperature for a desired period of time.

50. (new) The heating system as recited in claim 49, wherein a heating operation in the menu of heating operations is applying heat to the workpiece to reduce the workpiece temperature at a desired rate of temperature decrease.